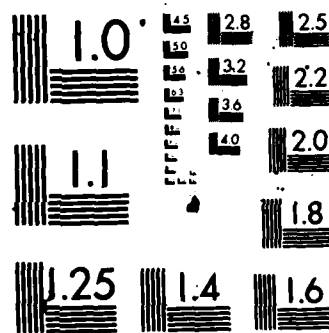


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| 19. ABSTRACT (Continue on reverse if necessary and identify by block number) This project approved the Symposium on Emerging Areas in Applied Mathematics held in conjunction with the SIAM 1985 Summer Meeting, June 24-26 in Pittsburgh, Pennsylvania. Eight invited speakers gave talks in four broad areas of applied mathematics: robotics, nonlinear partial differential equations and applications, scientific computing, and optimization. The meeting was very successful, with a total attendance of more than 400, including representatives of 8 nations. | | | | | |
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**FINAL TECHNICAL REPORT
SIAM 1985 Summer Meeting June 24-26, 1985
Hyatt at Chatham Center
Pittsburgh, Pennsylvania**

I. INVITED SPEAKERS

Eight invited speakers gave talks in four broad areas of applied mathematics. The featured speakers and their topics were as follows:

*** Robotics**

Mathematical Opportunities in Automated Manufacturing, Daniel Berg, Rensselaer Polytechnic Institute; Obstacle Avoidance in Robotics, Raj Reddy, Carnegie-Mellon University.

*** Nonlinear Partial Differential Equations and Applications**

Pattern Selection in Nonlinear Reaction-Diffusion Systems, Hans F. Weinberger, University of Minnesota; Advances in Solving the Nonlinear Evolution Equations of Continuum Physics, Constantine M. Dafermos, Brown University; Symmetry Breaking in Mathematical Problems of Biology and Physics, Joel Smoller, The University of Michigan.

*** Scientific Computing**

The Particle Method and Some Applications to Fluid Dynamics, Pierre A. Raviart, Universite Pierre et Marie Curie, Paris, France; Group Renormalization Methods for Turbulent Flows, Steven A. Orszag, Princeton University.

*** Optimization**

Nonconvex Problems in Homogenization with Applications to Composite Materials, Gilbert Strang, Massachusetts Institute of Technology.

II. SPECIAL LECTURES

One special lecture was presented at the meeting:

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* The John von Neumann Lecture

Configural Polysampling, John W. Tukey, Princeton University,
and AT&T Bell Laboratories, New Jersey.

III. MINISYMPOSIA

Twenty minisymposia were conducted at the meeting. Their titles and organizers were:

Numerical Solution of Partial Differential Equations I, R. A. Nicolaides, Carnegie-Mellon University; Supercomputer - Algorithms and Applications I, Jack J. Dongarra, Argonne National Laboratory, Illinois; Four New Problems and Algorithms, Richard J. Duffin, Carnegie-Mellon University; Pattern Selection in Solidification Phenomena, David J. Wollkind, Washington State University; Combinatorics and Graph Theory I, William T. Trotter, Jr. University of South Carolina; Models for Spatial and Temporal Patterns in Biological Systems, Leah Edelstein-Keshet, Duke University; Gradient and Finite Element Techniques in Optimal Control, Caulton L. Irwin, West Virginia University; Combinatorics and Graph Theory II, William T. Trotter, Jr. University of South Carolina; Mathematical Questions in Robotics, Samuel P. Marin, General Motors Research Laboratories, Michigan; Numerical Solution of Partial Differential Equations II, James Boland, University of Pittsburgh, and Janet Peterson, University of Pittsburgh; Global Methods for Nonlinear Systems of Equations, Layne T. Watson, Virginia Polytechnic Institute and State University, and Alexander P. Morgan, General Motors Research Laboratories, Michigan; Optimization of Large Engineering Systems, Vadim Komkov, Winthrop College, South Carolina; Lattice Algorithms and Their Applications, R. Kannan, Carnegie-Mellon University, and Nimrod Megiddo, IBM Research Laboratory, California; Gradient and Finite Element Techniques in Optimal Control II, Caulton L. Irwin, West Virginia University; Demonstrations of Linear Algebra Software for Microcomputers I, Robert C. Ward, Oak Ridge National Laboratory, Tennessee; Differential Algebraic Equation Systems, Thomas A. Porsching, University of Pittsburgh; Mathematical Models in Ecotoxicology, Thomas G. Hallan, University of Tennessee; Supercomputer - Algorithms and Applications II, Jack Dongarra, Argonne National Laboratory, Illinois; Numerical Approximation, M. J. Marsden, University of Pittsburgh, and A. R. Reddy, University of Pittsburgh; Demonstrations of Linear Algebra Software for Microcomputers II, Robert C. Ward, Oak Ridge National Laboratory, Tennessee.

IV. SPECIAL EVENTS

An all day program for high school mathematics teachers was held. This program for teachers was built around other meeting events and two special events: a film series and an industry forum.

The film series featured five 20 minute television video tapes distributed by the Mathematical Association of America, featuring men and women in mathematics related careers. The industry forum featured representatives from several industrial concerns and national laboratories, explaining the role of mathematicians at their companies. This session appealed to SIAM members as well as the teachers. The firms and representatives involved were:

Exxon Research and Engineering Company, Norm Nelson; National Bureau of Standards, Frances Sullivan; Boeing Computer Services Co., John Johnson; AT&T Bell Laboratories, William M. Coughran Jr.; PPG Industries Inc., David Sartori; Pratt & Whitney Aircraft, Leon Seitelman; General Motors Research Laboratories, James Cavendish; Bettis Atomic Power Laboratories, Myron Sussman; KMS Fusion Inc., Joseph McGrath; Westinghouse Inc., Deborah LaPay.

V. CONTRIBUTED PAPERS

Thirteen contributed paper sessions and one technical poster session were presented at the meeting. Included in these were 120 papers representing a broad spectrum of applied mathematics and applications.

Summary

The Pittsburgh meeting was extremely successful. There was a total attendance of 439 + 54 teachers, representing a total of 8 countries which included Canada, Chile, France, Italy, United Kingdom, Yugoslavia, Taiwan, and the United States. The three day meeting and accommodating weather combined to present an environment for technical interchange in both leisurely and formal settings. The special program for teachers, together with the presence of several world class mathematicians added greatly to the meeting. The sessions were well attended throughout the meeting.

Society for Industrial and Applied Mathematics
117 South 17th Street, 14th Floor
Philadelphia, PA 19103

August 21, 1985

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